

**HASTELLOY® C-22® alloy**

UNS No. N06022

56Ni<sup>a</sup>-22Cr-13Mo-3Fe-3W-2.5Co\*-0.5Mn\*-0.35V\*-0.08Si\*-0.01C\*<sup>a</sup>As Balance \*Maximum

**Fabrication of  
HASTELLOY® Corrosion-  
Resistant Alloys**

**Technical Papers**

**Material Safety Data  
Sheets (MSDS)**

**Request for Literature**

**Applicable Specifications**

**C-22® Trademark**

**The Statue of Liberty,  
and this "old soldier"**

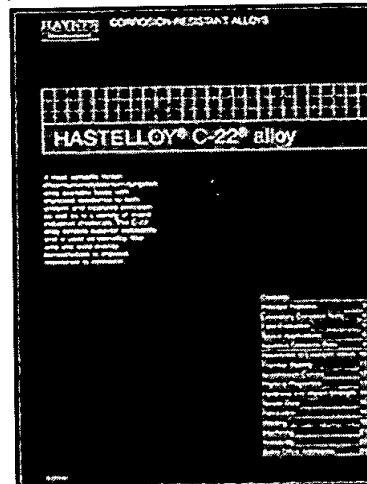
**HASTELLOY® Pipe  
Fittings -  
Flanges and Fittings**

A most versatile nickel- chromium- molybdenum- tungsten alloy available today with improved resistance to both uniform and localized corrosion as well as to a variety of mixed industrial chemicals. The C-22 alloy exhibits superior weldability and is used as overalloy filler wire and weld overlay consumables to improve resistance to corrosion.

Principal Features  
Laboratory Corrosion Tests  
Field Evaluation  
Typical Applications  
Aqueous Corrosion Data  
Resistance to Localized Attack

Thermal Stability  
Isocorrosion Curves  
Physical Properties  
Hardness and Impact Strength

Tensile Data  
Fabrication  
Welding  
Machining  
Availability  
Acknowledgment  
Health & Safety  
Sales Office Addresses



**HASTELLOY® C-22® alloy Product  
Brochure** is saved in .pdf format. To view  
and print the data sheets you may need to  
download Adobe® Acrobat® Reader™.



H-2019F

For more information send e-mail to: [corrosion\\_alloy\\_info@haynesintl.com](mailto:corrosion_alloy_info@haynesintl.com)

**HAYNES® Home**

## APPLICABLE SPECIFICATIONS

This list contains applicable material specifications for Haynes International corrosion-resistant and heat-resistant alloys. It is organized alphabetically by alloy name, with each specification designated by the originator and the product form(s) covered. It should be noted that all forms, process conditions, thermal treatments or sizes are not necessarily available for all alloys. Also, some exceptions may be taken, based upon existing capabilities to produce or qualify material.

The specification to which each product is to be supplied should be included with both the inquiry and order for an alloy.

Some applicable specifications may not have been listed at the time of this printing. The fact that a specification is not listed does not mean that it is unavailable. Normally, the latest revision of each specification will apply.

H-1034L Applicable Specifications .pdf file [H1034L.pdf](#).  
You may need to download [Adobe® Acrobat® Reader™](#).

HASTELLOY® Products	HAYNES® Products	Specialty Products
<ul style="list-style-type: none"> <li>• <a href="#">B alloy</a></li> <li>• <a href="#">B-2 alloy</a></li> <li>• <a href="#">B-3® alloy</a></li> <li>• <a href="#">C-4 alloy</a></li> <li>• <a href="#">C-22® alloy</a></li> <li>• <a href="#">C-276 alloy</a></li> <li>• <a href="#">C-2000® alloy</a></li> <li>• <a href="#">G-3 alloy</a></li> <li>• <a href="#">G-30® alloy</a></li> <li>• <a href="#">G-50® alloy</a></li> <li>• <a href="#">H-9M™ alloy</a></li> <li>• <a href="#">N alloy</a></li> <li>• <a href="#">S alloy</a></li> <li>• <a href="#">W alloy</a></li> <li>• <a href="#">X alloy</a></li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">25 alloy</a></li> <li>• <a href="#">R-41 alloy</a></li> <li>• <a href="#">HR-120® alloy</a></li> <li>• <a href="#">HR-160® alloy</a></li> <li>• <a href="#">188 alloy</a></li> <li>• <a href="#">214™ alloy</a></li> <li>• <a href="#">230® alloy</a></li> <li>• <a href="#">230-W™ alloy</a></li> <li>• <a href="#">242™ alloy</a></li> <li>• <a href="#">263 alloy</a></li> <li>• <a href="#">556™ alloy</a></li> <li>• <a href="#">617 alloy</a></li> <li>• <a href="#">625 alloy</a></li> <li>• <a href="#">625SQ™ alloy</a></li> <li>• <a href="#">718 alloy</a></li> <li>• <a href="#">X-750 alloy</a></li> <li>• <a href="#">6B alloy</a></li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">MULTIMET® alloy</a></li> <li>• <a href="#">Ti-3Al-2.5V alloy</a></li> <li>• <a href="#">ULTIMET® alloy</a></li> <li>• <a href="#">Waspaloy alloy</a></li> </ul>

### HASTELLOY® B alloy (UNS N10001) Metal No. 2620

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ASME/ASTM	SB 333/B 333	Sheet, Plate and Strip
ASME/ASTM	SB 335/B 335	Rod
ASME/ASTM	SB 619/B 619	Welded Pipe
ASME/ASTM	SB 622/B 622	Seamless Pipe and Tube
ASME/ASTM	SB 626/B 626	Welded Tubes
ASME/ASTM	SB 366/B 366	Fittings
ASME	Section III, Class 3	All Forms
ASME	Section VIII, Division 1	All Forms
ASME	Section VIII, Division 2	All Forms

ASME	SFA 5.11 (ENiMo-1)	Covered Welding Electrodes
AWS	A 5.11 (ENiMo-1)	Covered Welding Electrodes
ASME	SFA 5.14 (ERNiMo-1)	Bare Welding Rods
AWS	A 5.14 (ERNiMo-1)	Bare Welding Rods
NACE	MR 01-75	Metallic Materials for Oil Field

**HASTELLOY® B-2 alloy (UNS N10665) Metal No. 2665**

Material Safety Data Sheets H2071 and H1072

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ASTM	B 564	Forgings
ASME/ASTM	SB 333/B 333	Sheet, Plate and Strip
ASME/ASTM	SB 335/B 335	Rod
ASME/ASTM	SB 619/B 619	Welded Pipe
ASME/ASTM	SB 622/B 622	Seamless Pipe and Tube
ASME/ASTM	SB 626/B 626	Welded Tubes
ASME/ASTM	SB 366/B 366	Fittings
ASME	Section III, Class 3	All Forms
ASME	Section VIII, Division 1	All Forms
ASME	Section VIII, Division 2	All Forms
ASME	B16.5	Pipe Flanges and Flanged Fittings
ASME	B16.34	Valves-Flanged, Threaded, and Welding Ends
ASTM	B 462	Pipe Flanges, Forged Fittings
ASTM	B 472	Billets and Bars for reforging
ASME	SFA 5.11 (ENiMo-7)	Covered Welding Electrodes
AWS	A 5.11 (ENiMo-7)	Covered Welding Electrodes
ASME	SFA 5.14 (ERNiMo-7)	Bare Welding Rods
AWS	A 5.14 (ERNiMo-7)	Bare Welding Rods
DIN	17744 No. 2.4617	All Forms
DIN	NiMo28	All Forms
DIN	2.4615 (SG-NiMo27)	Bare Welding Rods
DIN	2.4616 (EL-NiMo29)	Covered Welding Electrodes
TUV	Werkstoffblatt 436	All Forms
TUV	Kennblatt 2663.02	Welding Wire
TUV	Kennblatt 2664.02	Welding Rod
TUV	Kennblatt 2662.02	Covered Welding Electrodes

**HASTELLOY® B-3 alloy (UNS N10675) Metal No. 2675**

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ASME/ASTM	SB 333/B 333	Sheet, Plate and Strip
ASME/ASTM	SB 335/B 335	Rod
ASME/ASTM	SB 619/B 619	Welded Pipe
ASME/ASTM	SB 622/B 622	Seamless Pipe and Tube
ASME/ASTM	SB 626/B 626	Welded Tube
ASME/ASTM	SB 564/B 564	Forgings
ASME/ASTM	SB 366/B 366	Fittings
ASTM	B 462	Pipe Flanges, Forged Fittings
ASTM	B 472	Billets and Bars for Reforging
ASME	Code Case 2140 (Sec. VIII, Div. 1)	All Forms
ASME	Section VIII, Division 1	All Forms
ASME	B16.5	Pipe Flanges and Flanged Fittings
ASME	B16.34	Valves-Flanged, Threaded, and Welding Ends
ASME	SFA 5.11 (ENiMo-10)	Covered Welding Electrodes
AWS	A5.11 (ENiMo-10)	Covered Welding Electrodes
ASME	SFA 5.14 (ERNiMo-10)	Bare Welding Rods
AWS	A5.14 (ERNiMo-10)	Bare Welding Rods

DIN	2.4696 (EL-NiMo28Cr)	Covered Welding Elec trodes
DIN	2.4695 (SG-NiMo30Cr)	Bare Welding Rods
DIN	17744 No. 2.4600	All Forms
DIN	NiMo29Cr	All Forms
TUV	Werkstoffblatt 517	All Forms
TUV	Kennblatt 7615.00	Welding Wire
TUV	Kennblatt 7616.00	Welding Rod
TUV	Kennblatt 7617.00	Covered Welding Electrodes

**HASTELLOY® C-4 alloy (UNS N06455) Metal No. 2455**

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ASME/ASTM	SB 366/B 366	Fittings
ASME/ASTM	SB 574/B 574	Rod
ASME/ASTM	SB 575/B 575	Plate, Sheet and Strip
ASME/ASTM	SB 619/B 619	Welded Pipe
ASME/ASTM	SB 622/B 622	Seamless Pipe and Tube
ASME/ASTM	SB 626/B 626	Welded Tubes
ASME	Section VIII, Division 1	All Forms
ASME	Section VIII, Division 2	All Forms
ASME	SFA 5.11 (ENiCrMo-7)	Covered Welding Electrodes
AWS	A 5.11 (ENiCrMo-7)	Covered Welding Electrode s
ASME	SFA 5.14 (ERNiCrMo-7)	Bare Welding Rods
AWS	A 5.14 (ERNiCrMo-7)	Bare Welding Rods
DIN	17744 No. 2.4610	All Forms
DIN	NiMo16Cr16Ti	All Forms
DIN	2.4611 (SG-NiMo16Cr16Ti)	Bare Welding Rods
DIN	2.4612 (EL-NiMo15Cr15Ti)	Covered Welding Elec trodes
TUV	Werkstoffblatt 424	All Forms
TUV	Kennblatt 2666.02	Welding Wire
TUV	Kennblatt 2667.02	Welding Rod
TUV	Kennblatt 2665.02	Covered Welding Electrodes

**HASTELLOY® C-22® alloy (UNS N06022) Metal No. 2277**

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ASME/ASTM	SB 366/B 366	Fittings
ASME/ASTM	SB 574/B 574	Rod
ASME/ASTM	SB 575/B 575	Plate, Sheet, Strip
ASME/ASTM	SB 619/B 619	Welded Pipe
ASME/ASTM	SB 622/B 622	Seamless Tubing
ASME/ASTM	SB 626/B 626	Welded Tubing
ASME/ASTM	SB 564/B 564	Forgings
ASTM	B 462	Pipe Flanges, Forged Fittings
ASTM	B 472	Billets and Bars for Reforging
ASME	Code Case N-621 (Sec. III, Cl 1)	Nuclear -All Forms
ASME	Code Case 2226 (Sec. I)	All Forms
ASME	Section III, Class 2	Nuclear - All Forms
ASME	Section III, Class 3	Nuclear - All Forms
ASME	Section VIII, Division 1	All Forms
ASME	B16.5	Pipe Flanges and Flanged Fitting:
ASME	B16.34	Valves-Flanged, Threaded, and Welding Ends
AWS	A5.11 (ENiCrMo-10)	Covered Welding Electrode es
ASME	SFA 5.11 (ENiCrMo-10)	Covered Welding Electrodes
AWS	A5.14 (ERNiCrMo-10)	Bare Welding Rods
ASME	SFA 5.14 (ERNiCrMo-10)	Bare Welding Rods
DIN	17744 No. 2.4602	All Forms

DIN	NiCr21Mo14W	All Forms
DIN	2.4635 (SG-NiCr21Mo14W)	Bare Welding Rods
DIN	2.4638 (EL-NiCr21Mo14W)	Covered Welding Electrodes
TUV	Werkstoffblatt 479	All Forms
TUV	Kennblatt 4535.00	Welding Wire
TUV	Kennblatt 4536.00	Welding Rod
TUV	Kennblatt 4534.01	Covered Welding Electrodes
NACE	MR-01-75	Metallic Materials for Oil Field

**HASTELLOY® C-276 alloy (UNS N10276) Metal No. 2760**

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ASME/ASTM	SB 366/B 366	Fittings
ASME/ASTM	SB 574/B 574	Rod
ASME/ASTM	SB 575/B 575	Plate, Sheet and Strip
ASME/ASTM	SB 619/B 619	Welded Pipe
ASME/ASTM	SB 622/B 622	Seamless Pipe and Tube
ASME/ASTM	SB 626/B 626	Welded Tubes
ASME/ASTM	SB 564/B 564	Forgings
ASTM	B 462	Pipe Flanges, Forged Fittings
ASTM	B 472	Billets and Bars for Reforging
ASME	Section III, Class 2	Nuclear - All Forms
ASME	Section III, Class 3	Nuclear - All Forms
ASME	Section VIII, Division 1	All Forms
ASME	Section VIII, Division 2	All Forms
ASME	B16.5	Pipe Flanges and Flanged Fittings
ASME	B16.34	Valves-Flanged, Threaded, and Welding Ends
ASME	SFA 5.11 (ENiCrMo-4)	Covered Welding Electrodes
AWS	A 5.11 (ENiCrMo-4)	Covered Welding Electrodes
ASME	SFA 5.14 (ERNiCrMo-4)	Bare Welding Rods
AWS	A 5.14 (ERNiCrMo-4)	Bare Welding Rods
DIN	17744 No. 2.4819	All Forms
DIN	NiMo16Cr15W	All Forms
DIN	2.4886 (SG-NiMo16Cr16W)	Bare Welding Rods
DIN	2.4887 (EL-NiMo15Cr15W)	Covered Welding Electrodes
TUV	Werkstoffblatt 400	All Forms
TUV	Kennblatt 320.01	Welding Rod
TUV	Kennblatt 319.03	Covered Welding Electrodes
Military	Mil-N-24390B	Cold-Reduced Bar
NACE	MR-01-75	Metallic Materials for Oil Field

**HASTELLOY® C-2000® alloy (UNS N06200) Metal No. 2316**

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ASME/ASTM	SB 564/B 564	Forgings
ASME/ASTM	SB 574/B 574	Rod
ASME/ASTM	SB 575/B 575	Plate, Sheet and Strip
ASME/ASTM	SB 619/B 619	Welded Pipe
ASME/ASTM	SB 622/B 622	Seamless Pipe and Tubing
ASME/ASTM	SB 626/B 626	Welded Tube
ASME/ASTM	SB 366/B 366	Fittings
ASTM	B 163	HE Tubes & Condenser Tubes, Seamless
ASTM	B 462	Pipe Flanges, Forged Fittings
ASTM	B 472	Billets and Bars for Reforging
ASME	Code Case 2240 (Sec. VIII, Div. 1)	All Forms
ASME	Code Case 2337 (F=44)	Bare Welding Rods
ASME	Code Case 2338 (F=44)	Covered Welding Electrodes

ASME	B16.5	Pipe Flanges and Flanged Fitting:
ASME	B16.34	Valves-Flanged, Threaded, and
		Welding Ends
AWS	A5.14 (ERNiCrMo-17)	Bare Welding Rods
AWS	A5.11 (ENiCrMo-17)	Covered Welding Electrodes
DIN	17744 No. 2.4675	All Forms
DIN	NiCr23Mo16 Cu	All Forms
DIN	2.4699 (EL-NiCr23Mo16Cu)	Covered Welding Electrodes
DIN	2.4698 (SG-NiCr23Mo16Cu)	Bare Welding Rods
TUV	Werkstoffblatt 539	All Forms
TUV	Kennblatt 9679.00	Welding Wire
TUV	Kennblatt 9678.00	Welding Rod
TUV	Kennblatt 9677.00	Covered Welding Electrodes

**HASTELLOY® G-3 alloy (UNS N06985) Metal No. 2985**

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ASME/ASTM	SB 366/B 366	Fittings
ASME/ASTM	SB 581/B 581	Bar
ASME/ASTM	SB 582/B 582	Sheet, Plate and Strip
ASME/ASTM	SB 619/B 619	Welded Pipe
ASME/ASTM	SB 622/B 622	Seamless Pipe and Tube
ASME/ASTM	SB 626/B 626	Welded Tubes
ASME	Section VIII, Division 1	All Forms
ASME	SFA 5.14 (ERNiCrMo-9)	Bare Welding Rods
ASME	SFA 5.11 (ENiCrMo-9)	Covered Welding Electrodes
AWS	A 5.11 (ENiCrMo-9)	Covered Welding Electrodes
AWS	A 5.14 (ERNiCrMo-9)	Bare Welding Rods
NACE	MR 01- 75	Metallic Materials for Oil Field

**HASTELLOY® G-30® alloy (UNS N06030) Metal No. 8103**

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ASME/ASTM	SB 366/B 366	Fittings
ASME/ASTM	SB 581/B 581	Bar
ASME/ASTM	SB 582/B 582	Sheet, Plate and Strip
ASME/ASTM	SB 619/B 619	Welded Pipe
ASME/ASTM	SB 622/B 622	Seamless Pipe and Tubing
ASME/ASTM	SB 626/B 626	Welded Tube
ASTM	B 462	Pipe Flanges, Forged Fittings
ASTM	B 472	Billets and Bars for Reforging
ASME	Section III, Class 2	Nuclear - All Forms
ASME	Section III, Class 3	Nuclear - All Forms
ASME	Section VIII, Division 1	All Forms
ASME	B16.5	Pipe Flanges and Flanged Fitting:
ASME	B16.34	Valves-Flanged, Threaded, and
		Welding Ends
ASME	SFA 5.14 (ERNiCrMo-11)	Covered Welding Electrodes
ASME	SFA 5.11 (ENiCrMo-11)	Bare Welding Rods
AWS	A5.14 (ERNiCrMo-11)	Bare Welding Rods
AWS	A5.11 (ENiCrMo-11)	Covered Welding Electrodes
DIN	No. 2.4603	All Forms
DIN	NiCr30FeMo	All Forms
NACE	MR-01- 75	Metallic Materials for Oil Field

**HASTELLOY® G-50® alloy (UNS N06950) Metal No. 8511**

Material Safety Data Sheet H2071